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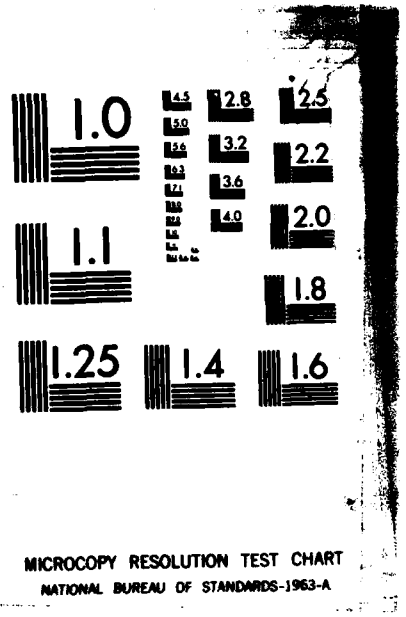

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AIR FORCE HUMAN RESOURCES LABORATORY

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HUMAN FACTORS PRODUCTS: A ONE-ACT PLAY WITH EPILOGUE

By

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Presents the thesis that the results of human factors research and development should be delivered as discrete products, not merely as a collective technical report. Describes 35 potential products useful for this purpose. Examples of the products are: drawings; handbooks; algorithms; evaluation data; task analysis results; methods; and criteria.

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This is a concept paper published in the interest of scientific and technical information exchange.

HUMAN FACTORS PRODUCTS
A One-Act Play With Epilogue

One-Act Play

Scene opens in the office of the Project Manager for the Mod 4 Wortle. Backgound music is heavy with occasional discord. Persons on stage are the Project Manager (PM) and a Human Factors Specialist(HFS).

PROJECT MANAGER: (Somewhat stiffly). So you finished your work. What do you have for me? Another tech report, I suppose?

HUMAN FACTORS SPECIALIST: (Excited). Not this time Chief! We've got other products!

PM: (Somewhat startled). Other products? Really? What are they?

HFS: (With growing confidence). Well, for starters we developed human factors design criteria for the Mod 4. We have evaluation data which describe the acceptability of the Mod 4 to potential customers. We developed an algorithm which can be used to predict its maintenance and support costs for various customer conditions, assuming we have a warranty contract. Finally, we developed a draft users manual for operation of the device by our customers.

PM: Impressive, but where are these products?

HFS: (Proudly). Right here. The design criteria are printed in this three- page engineering bulletin, ready for your signature and for circulation to the design team. The evaluation data are described in this letter to you and the other managers. The algorithm is available in printed form and on magnetic tape for use on the computer. The draft users manual is in this 12-page brochure, complete with illustrations; it needs only fine-tuning after the design is completed.

PM: Tremendous! (Teasing voice). No tech report?

HFS: (Lowers his head slightly). Well.....yes.....16 pages that describe the whole effort in a smooth-flowing, easy-to-read style. But it's really only backup to the products I've already given you. No more 96-page technical reports from our human factors group!

PM: What about the details of the data collection, the data analysis, and all those other fine points that the experts in your business might want to see?

HFS: All that detail is on microfiche stored in our library, and is available upon request from the Defense Technical Information Center and other repositories.

PM: (Surprised and impressed). Well I'll be darned! Real products. You really contributed to the project. Now about that pay raise.....

Scene fades. Soft, harmonious background music comes up.

Epilogue

Fantasy? I don't believe so. I believe that buried within human factors R&D work are lots of products that have value, that will solve real problems, and that will command the respect of the "hard" disciplines. I also believe that for too long we have been known as the discipline that produces long, boring, cumbersome technical reports. And you know about technical reports - they usually end up on the shelf, never to be read (See Footnote below).

To followup my hunch that there are a lot of products buried within technical documentation, I surveyed a sample of recent articles from the Human Factors journal (24 articles, 1980 issue), and looked for the products of the work. I did a similar survey of 27 work units completed by the Air Force Human Resources Laboratory during the period 1976 to 1980. Finally, I combined this information with what I know from my own experiences, and produced a list of products of human factors research and development. Table 1 lists and explains 35 products. The 35 products are grouped roughly into categories of similar items. The categories are listed roughly in order from tangible to less tangible.

I propose the following course of action regarding human factors R&D projects or application efforts. First, help customers define their research requirements or applied needs in such a way that specific products are identified to be the outcome of the work. Second, make each product a separate deliverable to the customer. Third, if a technical report is prepared, think of it as an adjunct to the products. And when preparing a technical report, remember Askren's laws (See Footnote below). I believe such an approach will improve our image with customers, enhance our reputation with the other technical disciplines, and in the long run, give us greater feelings of achievements.

In conclusion, Table 1 is not proposed as the final, definitive statement of all products resulting from human factors R&D. I believe that a more thorough investigation could establish the array of products and provide a standard reference (itself a product!) for the products. Armed with such a reference source, the human factors specialist could compete more successfully with the "harder" disciplines for increased funds, reputation, and useful deliverables.

Footnote

Askren's first law of technical reports: For every 100 people that read the title, 10 will read the abstract, and one will read the report. This relationship can be changed by keeping in mind Askren's second law of technical reports: the number of people reading a tech report is inversely related to number of pages.

TABLE 1

PRODUCTS* OF HUMAN FACTORS R&D

Category A

- **Drawing** - Usually an engineering drawing for proposed equipment.
- **Mockup** - A solid (hardboard, wood, plastic,) representation of a proposed design.
- **Prototype** - A first device of a proposed design.

Category B

- **Handbook** - Compilation of information and data.
- **Training Curriculum** - Detailed information on the content of a specific training course.
- **Training Manual** - Detailed guidance information for instructors (or students) on teaching methods (or learning procedures).
- **Users Guide** - Detailed information concerning the operation of a specific product such as a piece of equipment or a computer simulation model.

Category C

- **Algorithm** - A rule or procedure for solving a problem.
- **Equation** - Mathematical expression.
- **Model** - Structured analytical procedure.

Category D

- **Cost Data** - Dollar value of some activity, operation or product.
- **Evaluation Data** - Results of an assessment of a prior product.
- **Human Capacity Data** - Reach distances, lift pounds, sound-levels, etc.

TABLE 1 (Continued)

- **Output from a model** - Data resulting from operation of a model, such as manpower estimate from operation of the Logistics Composite Model (LCOM).

- **Task Analysis Results** - Tasks, task elements, task element times, skills and knowledges, etc. derived from application of a task analysis prodcedure.

Category E

- **Classification Scheme** - Taxonomy, structured code for information and data.

- **Computer software** - Instructions to a computer to perform operations.

- **Method** - Procedure for performing an operation.

- **Questionnaire** - Structured form for obtaining information and data from human participants.

- **Task Analysis Formats** - Structured description of the kinds of information and data to be collected during performance of a task analysis.

Category F

- **Criteria** - Standard against which a product is judged to determine the worth of the product.

- **Requirements** - Objectives, goals for a specific activity or operation.

- **Regulation, Standard** - Usually a government regulation or government standard in draft form which may define an area of work, prescribe a course of action, set limits, assign responsibility, etc.

- **Specifications** - Detailed description of the function, limits, capabilities, etc. of a desired product.

Category G

- **Alternatives, Options** - Potential solutions for a problem; potential courses of action.

TABLE 1 (Continued)

- **Plan** - A course of action to accomplish an objective.
- **Proposal** - Usually a formal statement about a desire to do specific work.
- **Recommendations** - For changes, new policies, improvements, etc.

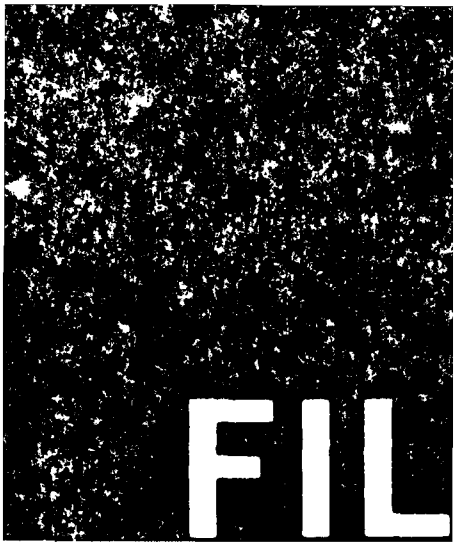
Category H

- **Definition** - A word or phrase expressing the essential nature of a thing.
- **Description** - Detailed explanation of some phenomenon, event, situation.
- **Examples** - Illustrations of some phenomenon, event, situation.

Category I

- **Cause** - Something that creates or effects an event, action, or condition.
- **Hypothesis** - A tentative assumption made in order to test its empirical consequences.
- **Concept** - An idea developed in the mind which could serve as the basis for the solution to a problem, the start of a new research effort.
- **Relationships Among Factors/Parameters** - Usually a quantitative expression of interactions among elements.

*Listed in alphabetical order within categories of similar items. Categories listed in order from most tangible to least tangible.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